

STATUS OF TASKS IN THE PLAN FOR THE IMPLEMENTATION OF THE COMMISSION'S PHASED APPROACH TO PROBABILISTIC RISK ASSESSMENT QUALITY

The plan for the implementation of the Commission's phased approach to probabilistic risk assessment (PRA) quality identified three tasks:

- (1) Task 1—Implementation of the Phased Approach
- (2) Task 2—Identification and Resolution of Technical Issues
- (3) Task 3—Development of a Communication Plan

The plan defined subtasks within Tasks 1 and 2. The following provides the status of each subtask.

Task 1—Implementation of the Phased Approach

Task 1.1: Identification of Current Risk-Informed Applications

Status: Complete (Agencywide Document Access and Management System (ADAMS) Accession No. ML042440885)

The objective of this task was to develop a list of the currently envisioned applications of PRA in the reactor arena. The list served as input to Task 1.2.

Task 1.2: Specification of the Risk-Informed Application PRA Needs

Status: Complete (ADAMS Accession No. ML043350083)

The objective of this task was, for each application type and based on the role of the PRA results in decisionmaking, to specify the scope and level of detail of the base PRA needed to support that role. The staff working on this task concluded that, for the majority of application types, the categorical definition of these issues is not possible because the nature of each specific application under an application type varies in terms of which elements of a PRA are affected and how. Furthermore, the significance of the different contributors to risk varies with plant design and location. Therefore, it is not appropriate, a priori, to conclude that any of the PRA standards is less important than another. Consequently, standards are needed for each item within scope, namely, internal initiating events, internal fires, and external initiating events, for the full-power and low-power and shutdown modes of operation.

Task 1.3: Phase 2 Guidance Document Schedule

Status: Updated

The objective of this task is to provide a schedule for developing the guidance necessary to transition to Phase 2 for each application type. The plan noted that the schedule would be

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modified as necessary. Because the schedule depends on when the American Society of Mechanical Engineers (ASME), the American Nuclear Society (ANS), and the Nuclear Energy Institute (NEI) complete work on the standards and other guidance documents, the staff has updated the schedule as shown in Table 1.

Table 1
Schedule for the Completion of Standards and Related Guidance
and U.S. Nuclear Regulatory Commission (NRC) Endorsement

PRA Standard or Related Guidance	Responsible Organization	Anticipated Completion	Anticipated NRC Endorsement
Internal initiating Events Level 1/LERF Standard, Addendum B	ASME	Completed (December 2005)	Completed (January 2007)
External Events Standard, Revision 1 (1)	ANS	March 2007	December 2008
Low-Power and Shutdown Standard	ANS	December 2007	December 2008
Internal Fire Standard	ANS	October 2007	December 2008
Integrated PRA Standard	ASME/ANS	December 2007	December 2008
Level 1/LERF Peer Review and Self-Assessment Guidance (2)	NEI	Completed (November 2006)	Completed (January 2007)
Internal Fire Peer Review Guidance (3)	Owners' Groups	Early 2007	October 2008
External Events Peer Review Guidance	(4)	--	--
Low-Power and Shutdown Peer Review Guidance	(4)	--	--
<p>NOTES:</p> <p>(1) Revision 0 of the ANS External Events PRA Standard was issued in March 2003, and endorsed by the staff in August 2004 in draft regulatory guide (DG) 1138. Revision 1 of the ANS External Events PRA Standard (to be published) resolves the majority of the staff objections in DG 1138.</p> <p>(2) Peer reviews have been completed on all licensee PRAs using the NEI peer review process. However, to date, not all licensees have resolved the peer review comments or completed their self-assessments. This may not be completed until required to support a risk-informed application.</p> <p>(3) Although guidance may be completed in early 2007, this date does not include the time period for performing the peer review.</p> <p>(4) No organization has initiated an effort to develop this guidance.</p>			

Task 1.4: Development of Guidance Documents

Status: Ongoing

The objective of this task is to develop the guidance documents for the applications identified in Task 1.2. The staff has been and continues to be active on the various consensus committees and writing groups supporting the development of the standards and guidance documents for specific applications.

Task 1.5: Development of Prioritization Process for Staff Review

Status: Nearing completion

The objective of this task is to establish a process for the prioritization and scheduling of staff reviews of licensee risk-informed submittals, particularly in the interim period before the achievement of Phase 3. The Commission directed that, once Phase 3 is achieved, the staff should give low priority to, or return, any submittal not in conformance with Phase 3 guidance. The staff has developed a prioritization process that considers the following factors:

- staff resources required to review the PRA results for those significant scope items not addressed by the use of standards (will differ if standards exist and have not been used, or if they have not been developed and endorsed)
- the safety benefit of the application
- the potential benefit to the licensee (e.g., economic, schedule for plant modification, refocusing of resources to maximize benefits)
- whether the application is furthering the state of practice
- whether the application is a pilot for an application

The staff is currently incorporating this prioritization process into LIC-101, "License Amendment Review Procedures" (ADAMS Accession No. ML040060258). To accommodate submittals that further the development of risk-informed approaches that have potentially significant safety and/or economic benefit, the staff has created a new category of submittals that is not subject to the normal time metrics.

Task 1.6: Phase 2 Implementation Schedule

Status: Updated

The objective of this task is to develop a schedule for submittals to meet Phase 2 requirements. The staff recognized that an implementation period is necessary between the completion of the PRA standards and associated guidance documents and the time by which the agency expects

each application to conform with those documents. The significant delay in developing the standards for the individual scope items has impacted the implementation schedule. As discussed in the memorandum, following the issuance of Revision 1 of Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," in January 2007, the staff will use its current practices for a limited period, not to exceed 1 year, to review routine, limited-scope applications, such as a request for an extension of the outage time allowed by a technical specification. However, for broad-scope applications, such as the implementation of Title 10, Section 50.69, "Risk-Informed Categorization and Treatment of Structures, Systems and Components for Nuclear Power Reactors," of the *Code of Federal Regulations* (10 CFR 50.69) or Technical Specification Initiative 4b, "Risk-Managed Technical Specifications," submitted during this phasing-in period, the staff expects that the submittal will include an assessment of the technical adequacy of the PRA using Revision 1 of RG 1.200. This is consistent with the industry guidance documents supporting these applications. For all applications received after December 2007, the staff will expect a licensee to demonstrate the technical adequacy of its PRA to support an application using Revision 1 of RG 1.200.

Similarly, the staff expects licensees to use Revision 2 of RG 1.200 to address PRA quality for consideration of the risk from internal fires, external events, and low-power and shutdown modes of operation beginning in late 2009.

Task 1.7: Development of Phase 3 Guidance

Status: To be performed

The objective of this task is to develop the Phase 3 guidance document. This umbrella document will identify and link all the documents related to current and anticipated applications, including application guidance documents and those related to assessing the appropriate quality of the PRAs addressing the scope items identified in the memorandum. This document will include Revision 2 of RG 1.200. Revision 1 of RG 1.200 only addresses a Level 1/large early release frequency (LERF) PRA for internal events (excluding internal fire) for full-power operation. Revision 2 will address PRAs for internal fire, external events, and low-power and shutdown modes of operation.

Task 1.8: Continued Monitoring of PRA Quality

Status: Ongoing

The objective of this task is to use opportunities provided by the risk-informed license application reviews and other activities to gain insights into the technical adequacy of licensee PRAs. One significant activity that led to a step change in the overall quality of licensee PRAs, was the implementation of the Mitigating Systems Performance Index (MSPI). The implementation of the MSPI required resolving the peer review comments that were identified as having a potential impact on the MSPI index and addressing any outlier behavior revealed by an industry cross-comparison and comparison with the results of the simplified plant analysis risk models.

Task 2—Identification and Resolution of Technical Issues

Status: Ongoing

The objective of this task is to identify and resolve new technical issues that emerge as the various guidance documents are developed, updated, and implemented. The plan discussed three specific issues identified by the Commission (see Tasks 2.1 through 2.3 below). The plan specifically mentioned the pilot testing of RG 1.200 and the use of the standardized plant analysis risk (SPAR) models as vehicles for identifying new technical issues. The activities associated with establishing that the licensee PRAs were of sufficient quality to support the implementation of the MSPI involved comparing the results of the licensee models with those of the SPAR models and provided another forum for identifying and discussing a number of technical issues. As a result of these activities, the staff has identified a number of issues and is evaluating the need for additional guidance. The Electric Power Research Institute is addressing two potentially significant issues, namely the modeling of support system initiating events and the modeling of the loss of offsite power initiating event.

Task 2.1: Model Uncertainty

Status: Ongoing

The objective of this task is to develop guidance on the treatment of model uncertainties and alternate methods in the decisionmaking process. The agency will issue NUREG-1855, "Guidance on the Treatment of Uncertainties and Alternate Methods in Risk-Informed Decisionmaking," as a draft for public comment in early 2007.

Task 2.2: Treatment of Seismic and Other External Events

Status: Updated

The objective of this task is to support the development of the ANS external events standard and to provide the staff position in an appendix to RG 1.200. In December 2003, ANS issued Revision 0 of ANS-58.21, "External Events—PRA Methodology," and the staff issued draft regulatory guide DG-1138, "NRC Regulatory Position on ANS External Hazards PRA Standard," endorsing the standard in August 2004. The NRC postponed its finalization of this draft guide when ANS decided to develop a revision to the external events standard that would address the majority of the staff's concerns expressed in the draft guide. The technical concerns of some members of the ANS standards committee have delayed the approval of this revision by the committee. A concerted effort has been made to resolve the negative ballots, and the revision is expected to be approved and published in early 2007. The staff plans to update DG 1138 and incorporate it into Revision 2 of RG 1.200.

Task 2.3: Human Performance Issues

Status: Ongoing

This task is covered by the Human Reliability Analysis (HRA) Research Program in the Office of Nuclear Regulatory Research. Three notable publications issued since the initiation of the plan are NUREG-1792, "Good Practices for Implementing Human Reliability Analysis (HRA)," issued April 2005; NUREG-1842, "Evaluation of Human Reliability Analysis Methods Against Good Practices," issued March 2006, and NUREG/CR-6903, "Human Event Repository and Analysis (HERA) System," issued July 2006. In addition, the staff has initiated a project to benchmark several HRA tools.

Task 3—Development of a Communication Plan

Status: Complete (ADAMS Accession No. ML053070320)

The objective of this task was to develop a communication plan to (1) explain staff activities to stakeholders, (2) describe the staff's approach, and (3) provide a structure for communicating the messages to stakeholders.